

CLAIMS:

1. A process for isolating molecules, cells and other particles which are specifically bound to a large particle comprising:

incubating a sample with at least one set of large-capturing particles each of which are able to specifically bind/capture a large number of molecules, cells or other particles contained in the sample;

analyzing the large-capturing particles mixed with the sample; and

sorting the large-capturing particles containing specifically bound molecules, cells or other particles.

2. A process according to claim 1, wherein said large-capturing particles may be of different sizes, materials, densities, and/or shapes.

3. A process according to claim 1, wherein different types of molecules, cells or other particles can be bound to the large-capturing particles.

4. A process according to claim 1, wherein the large-capturing particles are covered with or bound to specific antibodies, parts of antibodies, oligonucleotides or other types of probes specific for the binding of the molecules, cells and other particles of interest.

5. A process according to claim 1, wherein the sample is simultaneously or sequentially incubated with two or more different sets of large-capturing particles for the isolation/depletion of two or more different types of molecules, cells or other particles from the sample.

6. A process according to claim 1, wherein each set of large-capturing particles can specifically bind one, two or more different types of molecules, cells or other particles from the sample.

7. A process according to claim 1, wherein the incubation of the sample with the large-capturing particles is performed by:

(A) directly mixing the large-capturing particles with the sample containing the molecules, cells or other particles of interest;

(B) passing the sample one or more times through one or more chambers containing the large-capturing particles; or

(C) passing the large-capturing particles one or more times through the sample containing the molecules, cells or other particles of interest.

8. A process according to claim 1, wherein the distinction between the large-capturing particles bound to the molecules, cells or other sample particles is based on their scatter, fluorescence or combined scatter and fluorescence properties.

9. A process according to claim 1, wherein the large-capturing particles bound to molecules, cells or other sample particles are sorted into Petri dishes, microtiter plates or other layers.

10. A process according to claim 1, wherein different sample volumes and amounts of large-capturing particles can be used in combination.

11. A process according to claim 1, wherein the molecules, cells or other sample particles of interest are detached from the large-capturing particles after they are sorted.

12. A process according to claim 1, wherein the molecules are selected from the group consisting of DNA, mRNA, proteins, and peptides.

13. A process according to claim 1, wherein the other particles are selected from the group consisting of chromosomes, mitochondria, zymogen granules, and cell membranes.

14. A process according to claim 1, wherein the large particle is selected from the group consisting of latex, polystyrene, methacrylate, activated-aldehydes, polyethyleneglycol, and acrolein.